States, Communities & Drought

"Aqueducts of Rome," by Giovanni Piranesi

Kelly Helm Smith
National Drought Mitigation Center

July 22, 2015, Seattle, WA

Drought Coordinators Meeting


The Blue Marble
Nasa photo of Earth 1972

Landscape scale

- Water
- Land use
- Agriculture

"The Science and Policy of Climate Variability and Climate Change: Intersections and Possibilities," by Geoff Cockfield and Stephen Dovers, in *Drought, Risk Management and Policy: Decision Making Under Uncertainty*, ed. by Botterill and Cockfield, 2013

Photo: Compiled by Chuck Nelson. "A true-color cropped image of portion of the Sacramento-San Joaquin River Delta. This image was taken from a California Department of Fish and Game website available to the public as a GIS file and is part of a U.S. Department of Agriculture National Agricultural Imagery Program flight."

http://www.csuchico.edu/inside/2012-05-10/bigpicture-2.shtml

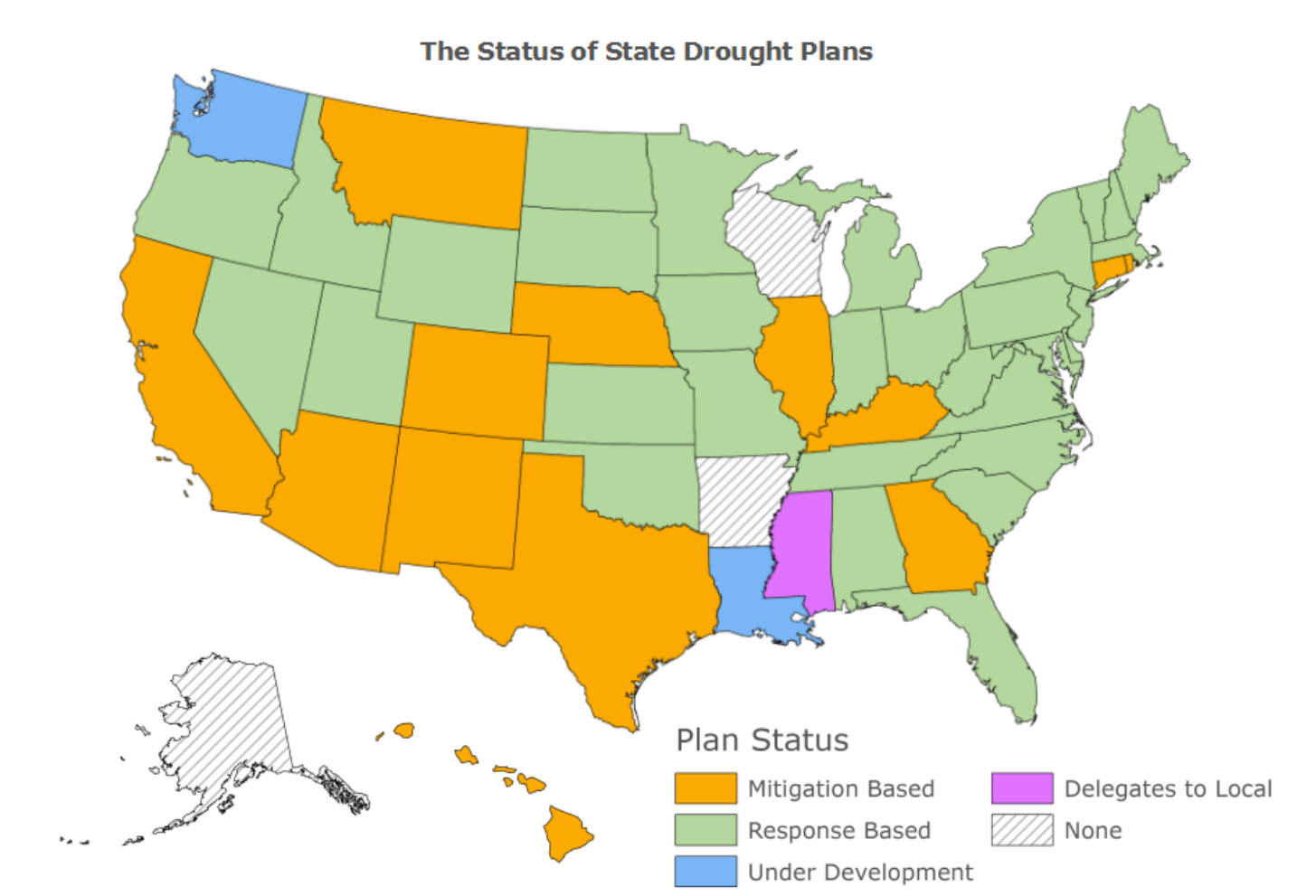
Local scale

From Bandera: Cowboy Capital of the World, Palo Alto College, San Antonio, Texas
http://pacweb.alamo.edu/InteractiveHistory/projects/rhines/StudentProjects/1999/bandera/BANDERA.htm

IDIS
University of Nebraska Lincoln
National Drought Mitigation Center

Aqueduct of Nero, by Piranesi

States and drought planning



http://drought.unl.edu/Planning/PlanningInfobyState.aspx

Typical state drought *responses*

- increasing communication
- issuing water restrictions
- facilitating and/or expediting water transfers or temporary permits
- purchasing water rights to keep water in streams
- financial support for public water suppliers
- permitting roadside haying
- ***activating state assistance and technical support***

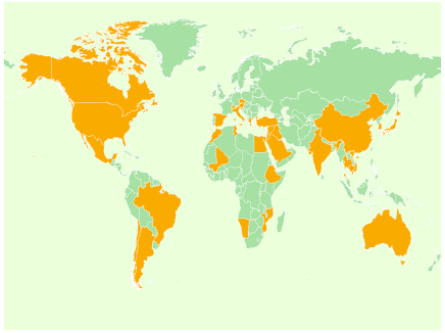
From Fontaine, Matthew M., Anne C. Steinemann, and Michael J. Hayes. 2014. "State Drought Programs and Plans: Survey of the Western United States." *Natural Hazards Review* 15: 95-99.

Typical state drought *mitigation strategies*

- increasing water conservation, especially for development and growth
- enhancing water supplies
- improving delivery infrastructure and inter-system connections
- increasing availability of monitoring data
- promoting rangeland fire insurance
- requiring public water systems to address drought in their planning documents
- ***encouraging local governments to develop drought plans***

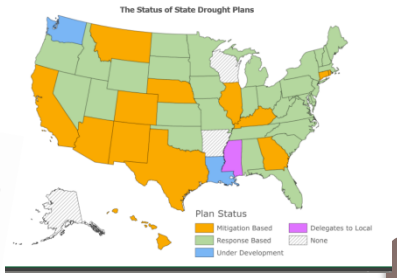
(Fontaine, Steinemann and Hayes, 2014)

Drought planning
Planning resources for all scales



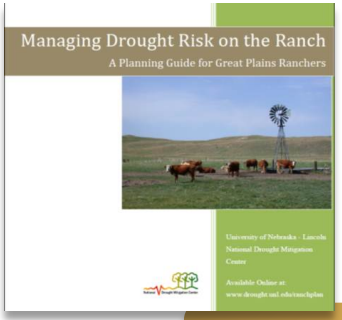
Nation

Basin



Tribal/ State

Community



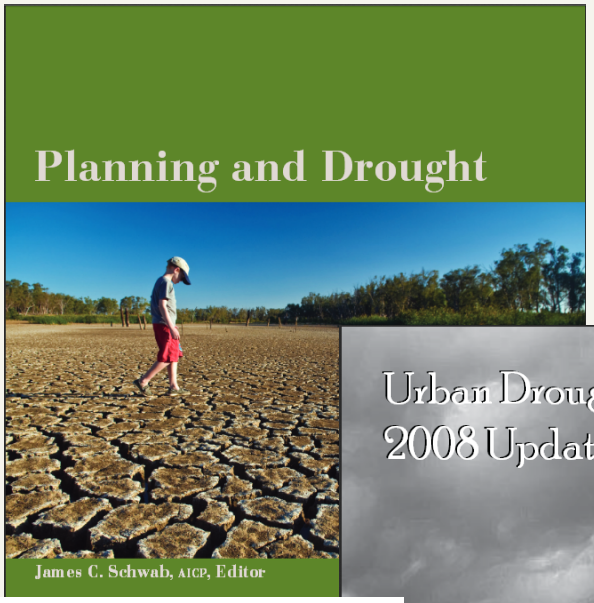
Individual

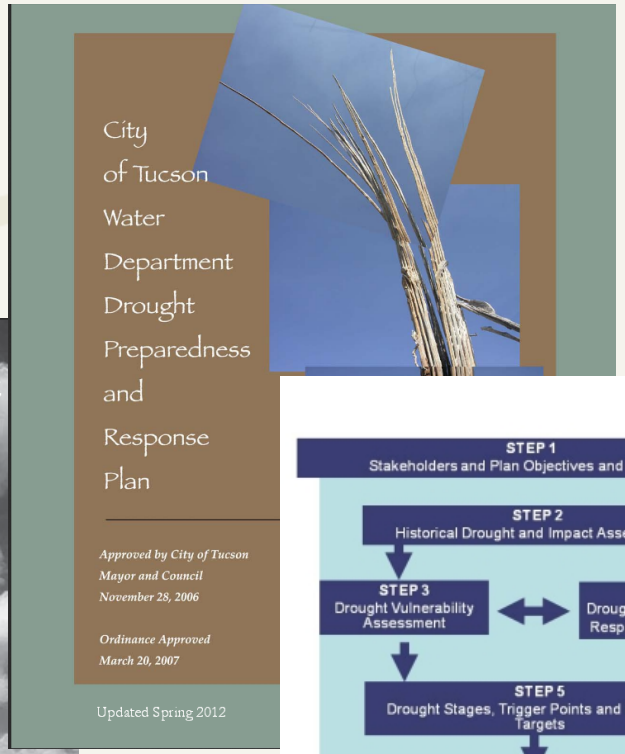
NIDIS

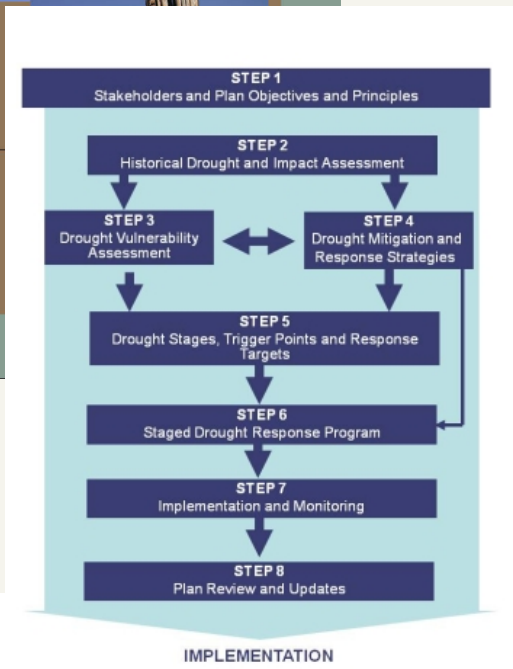
University of Nebraska Lincoln

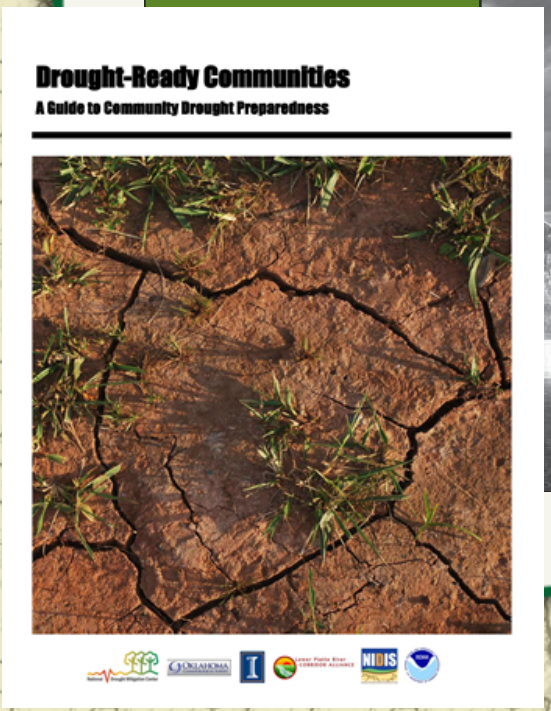
National Drought Mitigation Center

Municipal drought planning resources





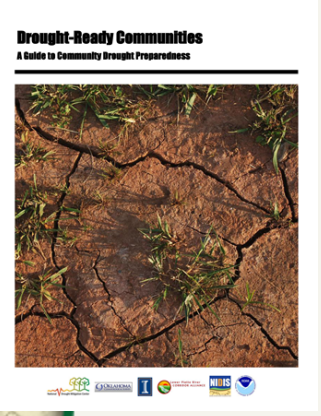




EPA

Incident Action Checklist – Drought

The actions in this checklist are divided up into three "rip & run" sections and are examples of activities that water and wastewater utilities can take to: prepare for, respond to and recover from drought. For on-the-go convenience, you can also populate the "My Contacts" section with critical information that your utility may need during an incident.



Drought Risk

Community Stakeholders

1. Getting Started

2. Info Gathering

3. Monitoring

4. Awareness and Education

5. Action Plan

1. Convene a planning group, connect with stakeholders, establish goal(s)

2. Analyze impacts and vulnerability

3. Establish monitoring and reporting protocols, including hydrologic, climatological and impact indicators

4. Build awareness

5. Drought Response: What will you do next time?

5. Mitigation: Identify and implement steps to reduce vulnerability before the next drought

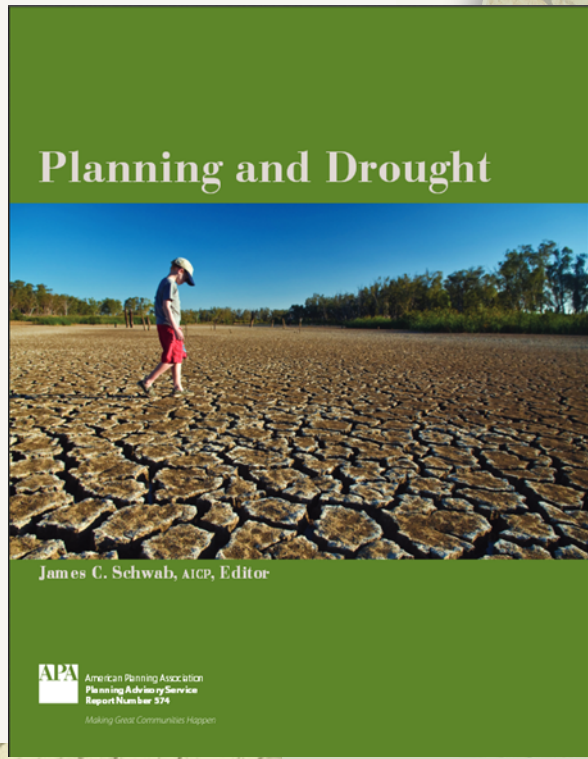
Drought-Ready

University of Nebraska Lincoln

National Drought Mitigation Center

Work drought planning into other plans:

- Multi-hazard
- Zoning
- Comprehensive
- Infrastructure
- Water supply management
- Stormwater and water treatment
- Climate adaptation
- Capital improvement
- Riparian and floodplain
- Conservation
- Watershed protection



Urban planning, urban form and water

"The provision of sufficient quantities of water for all forms of development while ensuring adequate supplies for agricultural and nonhuman use is arguably the most significant challenge faced by urban planning agencies." – Shandas and Parandvash 2010

Shandas, Vivek, and G. Hossein Parandvash. 2010. "Integrating Urban Form and Demographics in Water-Demand Management: An Empirical Case Study of Portland, Oregon." *Environment and Planning B: Planning and Design* 37(1) 112-128. doi:10.1068/b35036.

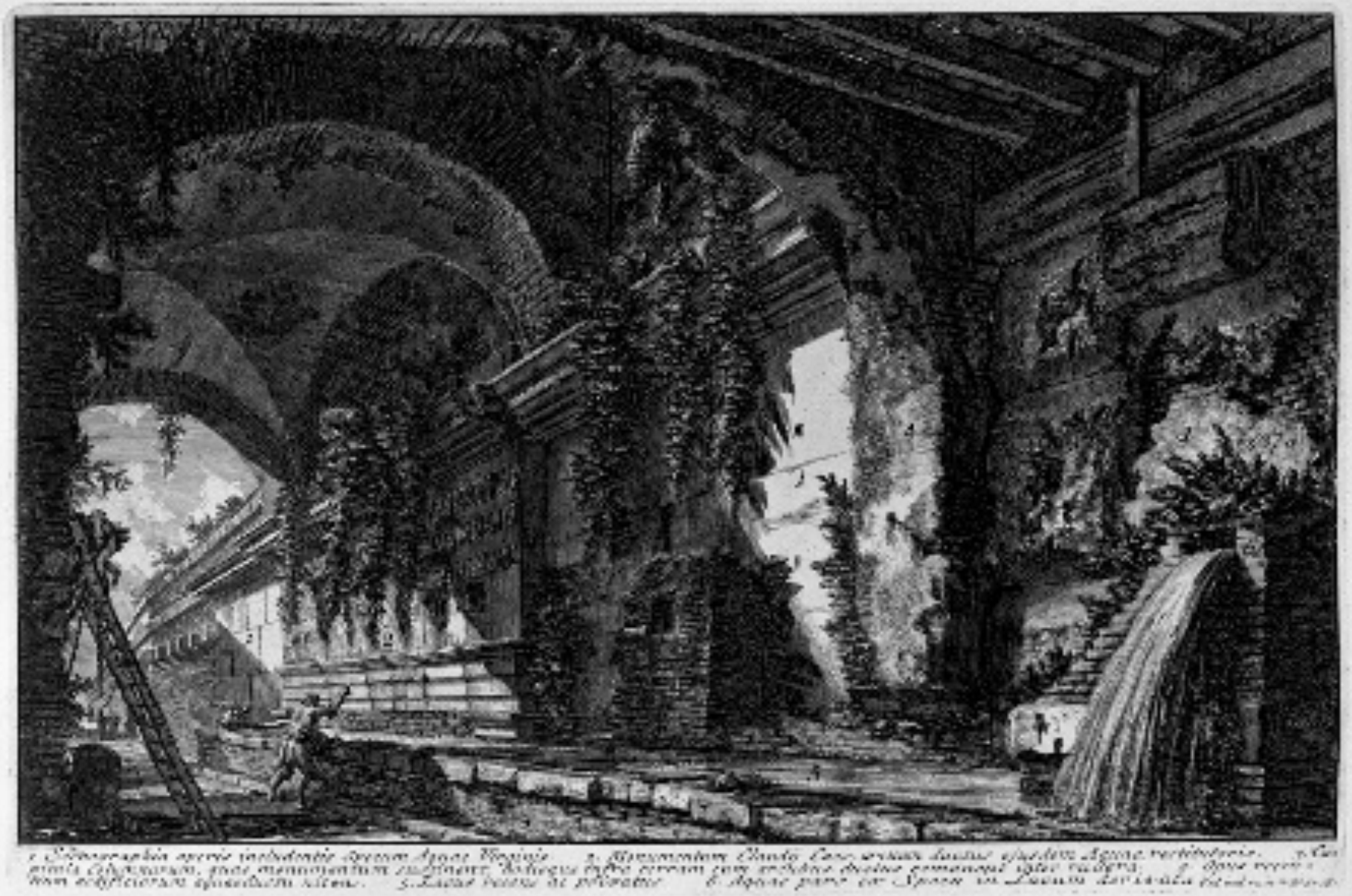
Predictors of urban water use

- Water price and rate structure
- Income and available technology
- Temperature and precipitation
- Household size
- Attitudes
- ***Built area***
- ***Lot size***

Conclusion: Denser developments use less water.

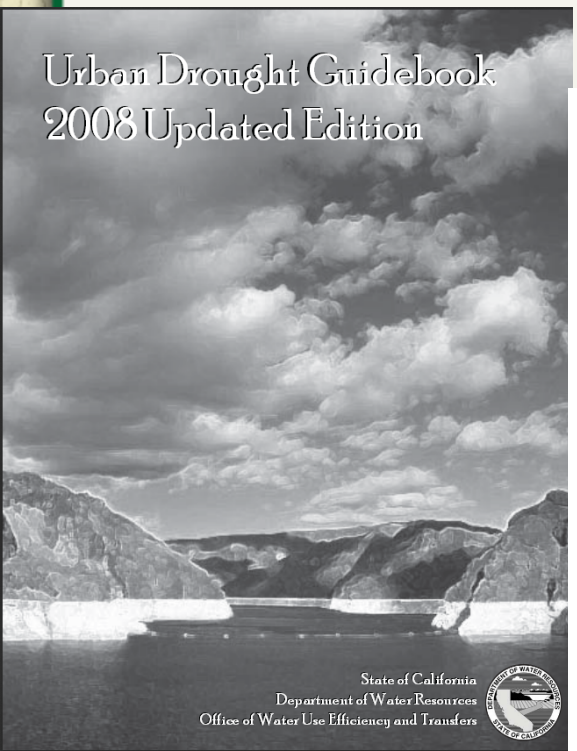
Shandas, Vivek, and G. Hossein Parandvash. 2010. "Integrating Urban Form and Demographics in Water-Demand Management: An Empirical Case Study of Portland, Oregon." *Environment and Planning B: Planning and Design* 37(1) 112-128. doi:10.1068/b35036.

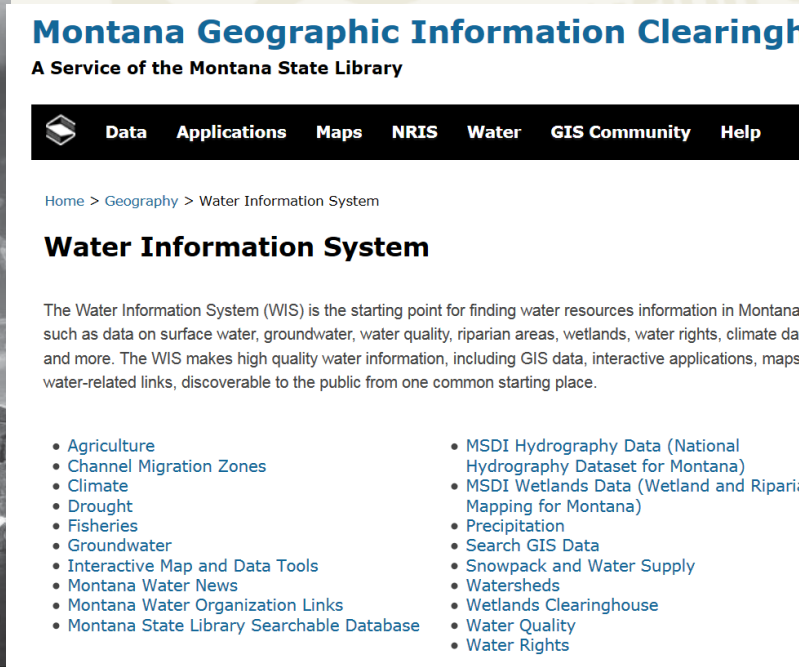
National Drought Mitigation Center
NIDIS
University of Nebraska Lincoln
National Drought Mitigation Center



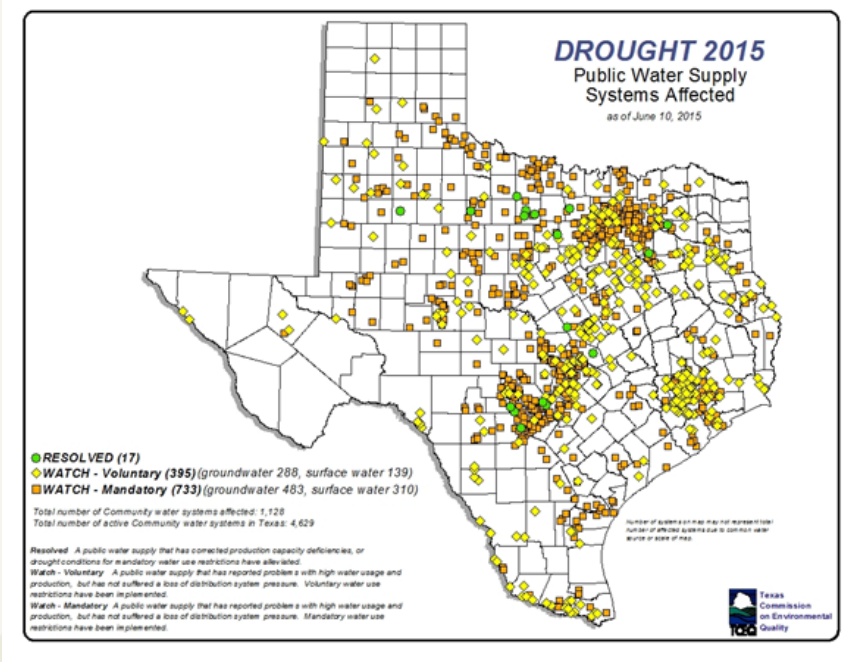
States boost local capacity

- Technical assistance
- GIS
- Monitoring
- Communication & organizational





States and public water suppliers



States:

- Track conservation status
- Provide technical assistance
- Provide financial assistance

States moderate development

Active Management Areas

AZ's Assured Water Supply program applies to subdivision development in five Active Management Areas.

- Pass Assured Water Supply Laws
- Create protected areas and regional planning authorities, such as the Lake Tahoe Region

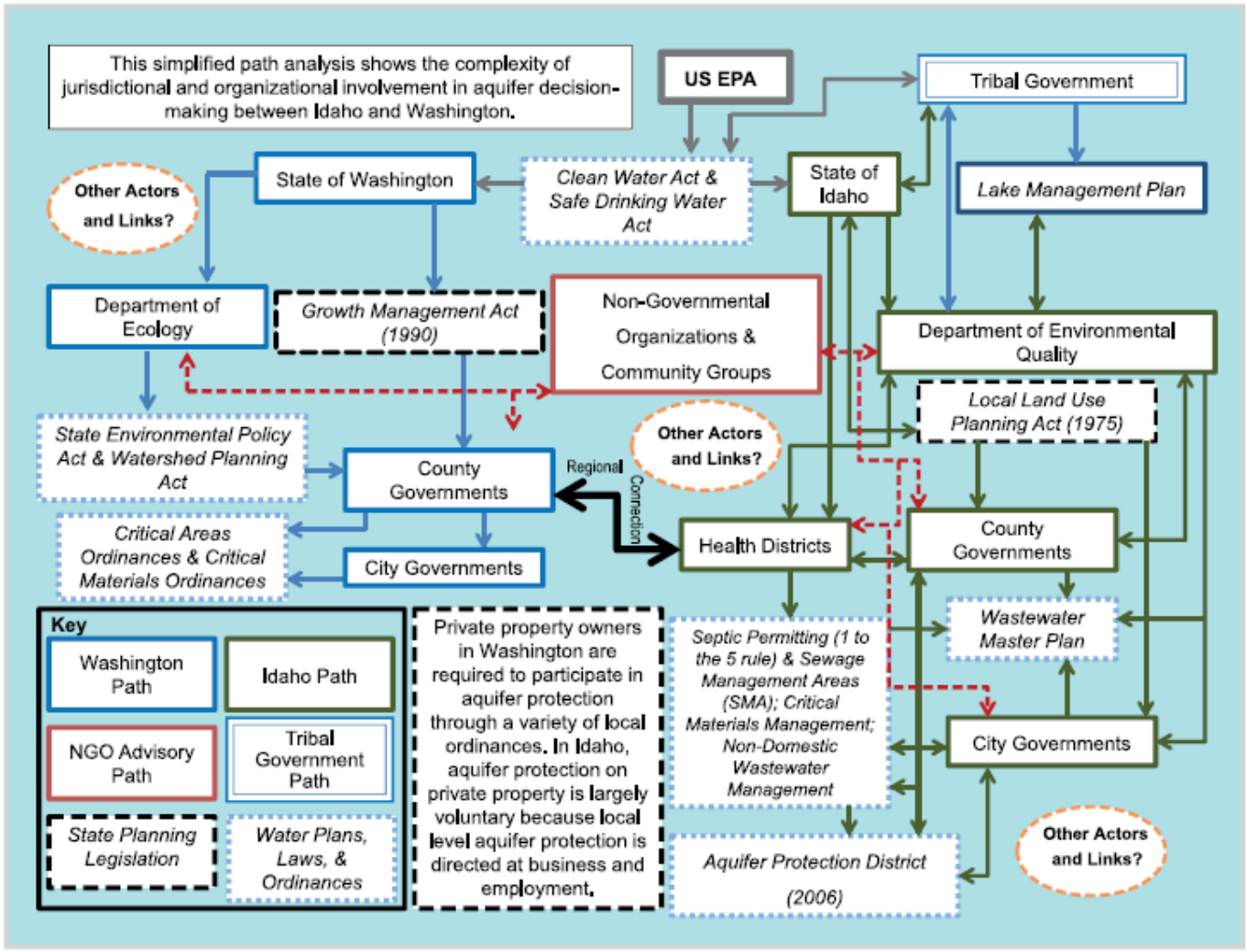
- … or Portland Metro

States foster or support planning and collaboration at interim levels, without creating new authority

- Five Nebraska Natural Resource Districts are planning for a sustainable water supply, hoping for support from a water sustainability fund approved by the state legislature in 2014
- Blackfoot Challenge, in Montana

States can foster poly-centric, networked governance

FIGURE 2 Complex agency and jurisdictional responsibilities in the I-90 corridor. (Design by J. Brooks, 2010)



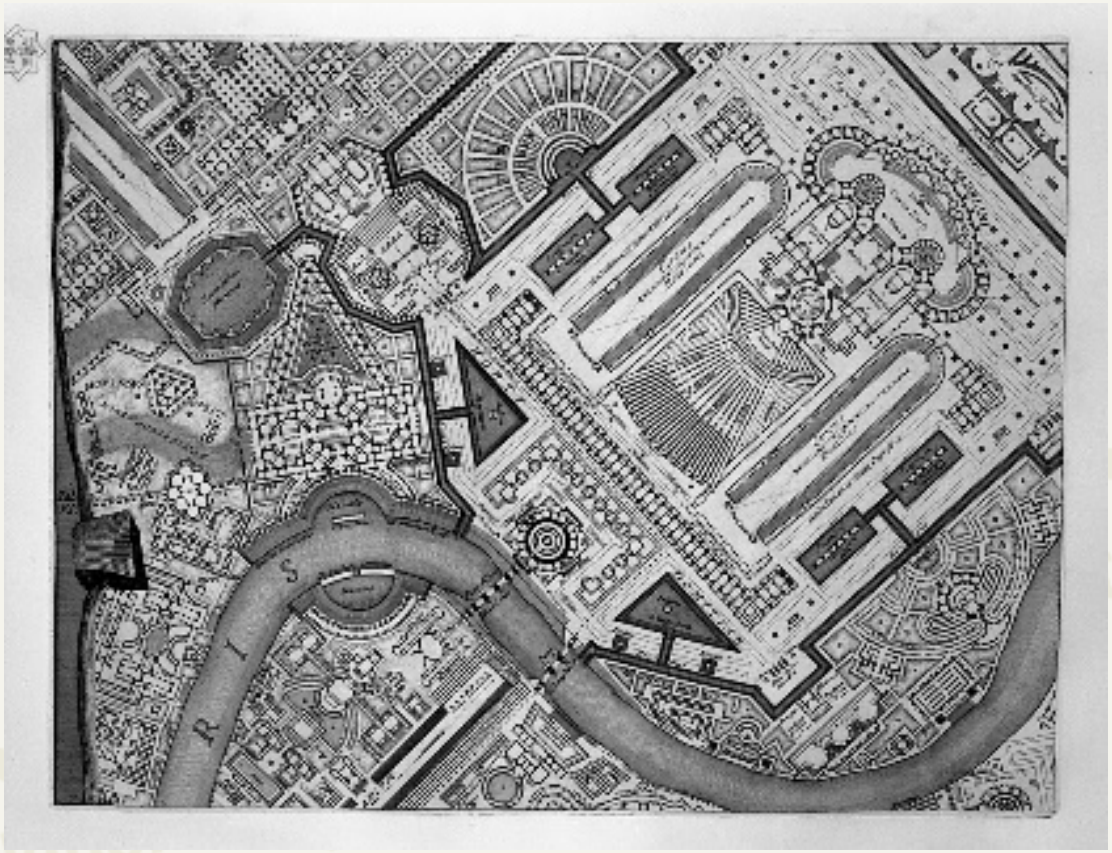
Jessica R. Daniel , Sandra Lee Pinel and Jase Brooks. “Overcoming Barriers to Collaborative Transboundary Water Governance.” Mountain Research and Development, 33(3):215-224. 2013. http://dx.doi.org/10.1659/MRD-JOURNAL-D-12-00121.1

NIDIS
University of Nebraska Lincoln
National Drought Mitigation Center

Networked Decision-Making

- Maintains and incorporates capacity and attention at many relevant scales.
- Allows flexible creation of "problem-sheds."
- Collaborative learning embeds scientific understanding into the community.
- Values learning and experimentation.

Questions, Comments?



From *Campus Martius*, by Piranesi

Kelly Helm Smith
402-472-3373
ksmith2@unl.edu